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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/863,405	Applicant(s) VAN DOAN ET AL.	
	Examiner Jin-Cheng Wang	Art Unit 2672	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09/11/2003 and 09/08/2003*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-38,40,42-52,54,56,57,59-74,76,78-85,87-89 and 91-116* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-38,40,42-52,54,56,57,59-74,76,78-85,87-89 and 91-116* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.

4) ☐ Interview Summary (PTO-413) Paper No(s). _____.

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: .

DETAILED ACTION

Response to Amendment

The amendments filed on 09/11/2003 and 09/08/2003 have been entered. Claims 1-36, 38, 40, 42-52, 56, 57, 59-74, 78-85, 87-89, and 91-116 have been amended. Claims 39, 41, 53, 55, 58, 75, 77, 86, and 90 have been canceled. Claims 1-38, 40, 42-52, 54, 56-57, 59-74, 76, 78-85, 87-89, 91-116 are pending in application.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 96 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 96 recites the limitation "the first hierarchical structure" in line 15 of the claim. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an

international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-38, 40, 42-52, 54, 56-57, 59-74, 76, 78-85, 87-89, 91-116 are rejected under 35 U.S.C. 102(e) as being anticipated by Politis U.S. Pat. No. 6,191,797 (hereinafter Politis).

3. Claim 1:

Politis teaches a method of creating an image, the image being formed by rendering at least a plurality of graphical objects to be composited according to a hierarchical structure representing a compositing expression for the image (see the abstract), the hierarchical structure including a plurality of nodes each representing at least one region of the image (see e.g., figures 3-4) or an operation for combining sub-expressions of the compositing expression (e.g., figure 4), said method comprising the steps of:

Determining at least a portion of opacity information (column 4, lines 1-39) for at least one node (e.g., node 50 of figures 7-8) of the hierarchical structure (image region representations in hierarchical data structures are known in the art as quadtrees), the portion of opacity information simultaneously identifying (the compositing operations for combining two portions of a single image involves the "simultaneously identifying") each opaque region (e.g., totally obscured region or opaque sub-image 42 of figure 6), transparent region (the foreground region 39 of figure 6) and partially transparent region (partially obscured region or the bounding box of text 43 of figure 6) of at least one object (a plurality of graphical elements) represented by the node (e.g., determining if the region represented by the node is obscured either totally or partially by one of the regions, see column 7, lines 20-64; column 9, lines 1-11);

Determining region representation (A region representation is known as quadtrees in which the creation of a quadtree representing a region of an image requires the sub-division of

the region into a plurality of cells or sub-regions, each cell being a portion of the region and each cell represented by a node of the quadtree, see the abstract, column 3, lines 44-58) for the node (e.g., node 50 of figures 7-8) based on the portion of opacity information (either the opaque sub-image 42 of figure 6 or the bounding box of text 43 of figure 6) associated with the node (e.g., the node 50 of figure 6; because the resolution of the region is represented by the quadtree), the region representation indicating at least one visible region (unobscured region such as the circle B of figure 6) of the object (the graphical element) represented by the node (if a node is partly obscured by one or more regions represented by other nodes in the expression, a clipping operator is applied to the node in such a way that, when executing a compositing operator, substantially unobscured or visible regions of the image represented at the node are in the resultant composite of the region of the node. When an image is composited and subsequently rendered from an expression tree comprising nodes clipped by a clipping operator, substantially those portions of the graphical elements that are unobscured or visible by other graphical element of the image are reproduced or rendered. See column 7, lines 20-64);

Partitioning the object (the object can be viewed as a single object or an object comprising a plurality of graphical elements) into a plurality of regions (Partitioning a space into cells. For example, the hierarchical data structures suitable for representing a region or portion of an image and such region representation is known as quadtrees in which the creation of a quadtree representing a region of an image requires the sub-division of the region into a plurality of cells, each cell being a portion of the region and each cell represented by a node of the quadtree, see the abstract, column 3, lines 44-58; figures 6-8; columns 12-14);

Overlaying (compositing) the region representation (the quadtree representation) on the partitioned object (any object or a plurality of graphical elements can be partitioned into a plurality of regions including an unobscured region) such that the partitioned object is substantially encompassed within the region representation (if the region represented by the node is encompassed or totally obscured by the one or more regions, see the abstract; column 15, lines 15-20);

Traversing the overlaid region representation to identify any of the plurality of regions of the partitioned object which include at least a portion of the visible region (Traversing the nodes of an object's quadtree, column 15, lines 21-45, column 8, lines 33-44);

Creating the image by rendering (compositing) the identified regions (column 1, lines 28-43; column 7, lines 44-54).

With regards to some of the claim elements, the Examiner notes that:

- A quadtree of Politis is a region representation in the claimed invention.
- The expression tree representing a region of image comprising text or other discrete graphical elements as shown in figures 3 and 6 is the object in the claim invention.
- Any object can be represented by discrete graphical elements or be partitioned into a plurality of sub-regions or cells and then be represented by a quadtree within the region representation of a hierarchical data structure. Therefore, this implies the "partitioning" and "overlaying" steps in the claimed invention.
- Traversing of the claim invention is the traversing means for the compositing of the graphical elements represented in the hierarchical data structure.

Claim 2:

The claim 2 encompasses the same scope of invention as that of claim 1 except additional claimed limitation of traversing the hierarchical structure to detect the node including the region representation. However, Politis further discloses the claimed limitation of traversing the hierarchical structure to detect the node including the region representation (column 15, lines 21-45, column 8, lines 33-44).

Claim 3:

The claim 3 encompasses the same scope of invention as that of claim 1 except additional claimed limitation that the region representation is traversed for each of the plurality of regions of the partitioned object. However, Politis further discloses the claimed limitation that the region representation is traversed for each of the plurality of regions of the partitioned object (column 15, lines 21-45, column 8, lines 33-44).

Claim 4:

The claim 4 encompasses the same scope of invention as that of claim 1 except additional claimed limitation of producing a map for the plurality of regions, wherein said map at least indicates any region which includes at least a portion of the visible region. However, Politis further discloses the claimed limitation of producing a map for the plurality of regions (tagged for clipping at a later stage), wherein said map at least indicates any region which includes at least a portion of the visible region (column 15, lines 54-67).

Claim 5:

The claim 5 encompasses the same scope of invention as that of claim 1 except additional claimed limitation that the map includes a flag for each of the regions which includes at least a portion of the visible region. However, Politis further discloses the claimed limitation that the map includes a flag for each of the regions which includes at least a portion of the visible region (column 20, lines 1-3).

Claim 6:

The claim 6 encompasses the same scope of invention as that of claim 1 except additional claimed limitation of "run length encoding". However, Politis further discloses the claimed limitation of "run length encoding" (column 3, lines 44-59).

Claim 7:

The claim 7 encompasses the same scope of invention as that of claim 4 except additional claimed limitation that said map is traversed in a predetermined order to determine said identified regions. However, Politis further discloses the claimed limitation that said map is traversed in a predetermined order to determine said identified regions (column 15, lines 7-67).

Claim 8:

The claim 8 encompasses the same scope of invention as that of claim 1 except additional claimed limitation of "right leaning hierarchical structure". However, Politis further discloses the claimed limitation of "right leaning hierarchical structure" (e.g., figures 4 and 5).

Claim 9:

The claim 9 encompasses the same scope of invention as that of claim 1 except additional claimed limitation that the hierarchical structure is a graphic object tree. However, Politis further discloses the claimed limitation that the hierarchical structure is a graphic object tree (column 14,

29-39, column 15, lines 7-67). The examiner interprets a graphic object tree as an expression tree.

Claim 10:

The claim 10 encompasses the same scope of invention as that of claim 1 except additional claimed limitation that the region representation is a quadtree. However, Politis further discloses the claimed limitation that the region representation is a quadtree (column 15, lines 7-67).

Claim 11:

The claim 11 encompasses the same scope of invention as that of claim 1 except additional claimed limitation of traversing the hierarchical structure to detect the node including the region representation. However, Politis further discloses the claimed limitation of traversing the hierarchical structure to detect the node including the region representation (column 15, lines 21-45, column 8, lines 33-44).

Claim 12:

The claim 12 encompasses the same scope of invention as that of claim 11 except additional claimed limitation that the region representation is traversed for each of the plurality of regions of the partitioned object. However, Politis further discloses the claimed limitation that the region representation is traversed for each of the plurality of regions of the partitioned object (column 15, lines 21-45, column 8, lines 33-44).

Claims 13-19:

The claim 13, 14, 15, 16, 17, 18 and 19 encompasses the same scope of invention as that of claim 11 except additional claimed limitation that is respectively identical to claim 4, 5, 6, 7, 8, 9, 10. The claims are rejected for the same reason set forth in above.

Claims 20-25:

The claim 20, 21, 22, 23, 24, 25 encompasses the same scope of invention as that of claim 1, 2, 3, 4, 9, 10 except additional claimed limitation of "an apparatus". However, Politis further discloses the claimed limitation of "an apparatus" (see the abstract, figure 12).

Claims 26-30:

The claim 26, 27, 28, 29, 30 encompasses the same scope of invention as that of claim 11, 12, 13, 18, 19 except additional claimed limitation of "an apparatus". However, Politis further discloses the claimed limitation of "an apparatus" (see the abstract, figure 12).

Claims 31:

The claim 31 encompasses the same scope of invention as that of claim 1 except additional claimed limitation of "a computer program for a computer comprising software code portions for performing a method". However, Politis further discloses the claimed limitation of "a computer program for a computer comprising software code portions for performing a method" (column 3, lines 36-37, column 18, lines 29-31).

Claims 32:

The claim 32 encompasses the same scope of invention as that of claim 1 except additional claimed limitation of "a computer readable medium storing a computer program". However, Politis further discloses the claimed limitation of "a computer readable medium storing a computer program" (figure 12, column 3, lines 36-37, column 18, lines 29-31).

4. Claim 33:

Politis teaches a method for optimizing an expression tree, the expression tree representing a compositing expression for compositing an image and comprising a plurality of nodes, each node of the tree representing at least one region of an object of the image or an operation for combining sub-expressions of the compositing expression, said method comprising the steps of:

Determining at least a portion of opacity information (column 4, lines 1-39) for at least one node (e.g., node 50 of figures 7-8) of the tree (image region representations in hierarchical data structures are known in the art as quadtrees), the portion of opacity information simultaneously identifying (the compositing operations for combining two portions of a single image involves the "simultaneously identifying") each opaque region (e.g., totally obscured region or opaque sub-image 42 of figure 6), transparent region (the foreground region 39 of figure 6) and partially transparent region (partially obscured region or the bounding box of text 43 of figure 6) represented by the node (e.g., determining if the region represented by the node is obscured either totally or partially by one of the regions, see column 7, lines 20-64; column 9, lines 1-11);

Optimizing the expression tree by determining obscurance information for at least (A region representation is known as quadtrees in which the creation of a quadtree representing a region of an image requires the sub-division of the region into a plurality of cells or sub-regions, each cell being a portion of the region and each cell represented by a node of the quadtree, see the abstract, column 3, lines 44-58) for the node of the tree (e.g., node 50 of figures 7-8) using

the portion of opacity information (either the opaque sub-image 42 of figure 6 or the bounding box of text 43 of figure 6) associated with the node (e.g., the node 50 of figure 6; because the resolution of the region is represented by the quadtree), wherein the obscurance information indicates at least one visible region (unobscured region such as the circle B of figure 6) represented by the node (if a node is partly obscured by one or more regions represented by other nodes in the expression, a clipping operator is applied to the node in such a way that, when executing a compositing operator, substantially unobscured or visible regions of the image represented at the node are in the resultant composite of the region of the node. When an image is composited and subsequently rendered from an expression tree comprising nodes clipped by a clipping operator, substantially those portions of the graphical elements that are unobscured or visible by other graphical element of the image are reproduced or rendered. See column 7, lines 20-64).

Claim 34:

The claim 34 encompasses the same scope of invention as that of claim 33 except additional claimed limitation of the opacity information being represented by a first hierarchical structure. However, Politis further discloses the claimed limitation of the opacity information being represented by a first hierarchical structure (column 10, lines 13-26).

Claim 35:

The claim 35 encompasses the same scope of invention as that of claim 33 except additional claimed limitation of the obscurance information being represented by a second hierarchical structure. However, Politis further discloses the claimed limitation of the obscurance

information being represented by a second hierarchical structure (column 7, lines 44-54, column 15, lines 53-67).

Claim 36:

The claim 36 encompasses the same scope of invention as that of claim 33 except additional claimed limitation of identifying nodes representing complex graphical object. However, Politis further discloses the claimed limitation of identifying nodes representing complex graphical object (column 15, lines 53-67). The examiner interprets a complex graphical object as a graphical object such as a bounding box comprising text.

Claim 37:

The claim 37 encompasses the same scope of invention as that of claim 33 except additional claimed limitation of determining opacity information for each node identified. However, Politis further discloses the claimed limitation of determining opacity information for each node identified (column 7, lines 44-54, column 15, lines 53-67).

Claim 38:

The claim 38 encompasses the same scope of invention as that of claim 37 except additional claimed limitation that the first hierarchical structure is dependent on the opacity information. However, Politis further discloses the claimed limitation that the first hierarchical structure is dependent on the opacity information (Table 1, column 7, lines 44-54, column 15, lines 53-67).

Claim 40:

The claim 40 encompasses the same scope of invention as that of claim 33 except additional claimed limitation that opacity information of a child node is at least propagated to a parent node associated with the child node. However, Politis further discloses the claimed limitation that opacity information of a child node is at least propagated to a parent node associated with the child node (column 15, lines 53-67).

Claim 42:

The claim 42 encompasses the same scope of invention as that of claim 33 except additional claimed limitation that obsurance information of a parent node is at least propagated to a child node associated with the parent node. However, Politis further discloses the claimed limitation that obsurance information of a parent node is at least propagated to a child node associated with the parent node (column 15, lines 7-67).

Claim 43:

The claim 43 encompasses the same scope of invention as that of claim 34 except additional claimed limitation that the hierarchical structure is dependent on an operation associated with a node for which the first hierarchical structure is constructed.

However, Politis further discloses the claimed limitation that the hierarchical structure is dependent on an operation associated with a node for which the first hierarchical structure is constructed (column 15, lines 7-67).

Claim 44:

The claim 44 encompasses the same scope of invention as that of claim 35 except additional claimed limitation that the second hierarchical structures for a node are constructed by

combining any first hierarchical structures associated with the node. However, Politis further discloses the claimed limitation that the second hierarchical structures for a node are constructed by combining any first hierarchical structures associated with the node (column 15, lines 7-67).

Claim 45:

The claim 45 encompasses the same scope of invention as that of claim 34 except additional claimed limitation that each leaf node of the first hierarchical structure is assigned a value depending on an opacity of a region associated with said leaf node. However, Politis further discloses the claimed limitation that each leaf node of the first hierarchical structure is assigned a value depending on an opacity of a region associated with said leaf node (Table 1, column 15, lines 7-67).

Claim 46:

The claim 46 encompasses the same scope of invention as that of claim 33 except additional claimed limitation of "right leaning tree". However, Politis further discloses the claimed limitation of "right leaning tree" (e.g., column 3, lines 44-59, figures 5 and 6).

Claim 47:

The claim 47 encompasses the same scope of invention as that of claim 34 except additional claimed limitation that each node of the first hierarchical structure comprises a pointer indicating children nodes associated with the node. However, Politis further discloses the claimed limitation that each node of the first hierarchical structure comprises a pointer indicating children nodes associated with the node (column 20, lines 1-3).

Claim 48:

The claim 48 encompasses the same scope of invention as that of claim 35 except additional claimed limitation that the second hierarchical structure is quadtree. However, Politis further discloses the claimed limitation that the second hierarchical structures is a quadtree (column 15, lines 7-67).

Claim 49:

The claim 49 encompasses the same scope of invention as that of claim 33 except additional claimed limitation that opacity information is represented by bounding boxes. However, Politis further discloses the claimed limitation that opacity information is represented by bounding boxes (column 15, lines 7-67).

Claim 50:

The claim 50 encompasses the same scope of invention as that of claim 33 except additional claimed limitation that obscurance information is represented by bounding boxes. However, Politis further discloses the claimed limitation that obscurance information is represented by bounding boxes (column 15, lines 7-67).

5. Claim 51:

Politis teaches a method for optimizing an expression tree (column 8, lines 45-60), the expression tree representing a compositing expression for compositing an image and comprising a plurality of nodes, each node of the tree representing at least one region of an object of an image or an operation for combining sub-expressions of the compositing expression, said method comprising the steps of:

Determining a first hierarchical structure for at least one node (e.g., node 50 of figures 7-8) of the tree (image region representations in hierarchical data structures are known in the art as quadtrees), the first hierarchical structure simultaneously identifying (the compositing operations for combining two portions of a single image involves the "simultaneously identifying") each opaque region (e.g., totally obscured region or opaque sub-image 42 of figure 6), transparent region (the foreground region 39 of figure 6) and partially transparent region (partially obscured region or the bounding box of text 43 of figure 6) represented by the node (e.g., determining if the region represented by the node is obscured either totally or partially by one of the regions, see column 7, lines 20-64; column 9, lines 1-11);

Optimizing the expression tree by determining a second hierarchical structure (A region representation is known as quadtrees in which the creation of a quadtree representing a region of an image requires the sub-division of the region into a plurality of cells or sub-regions, each cell being a portion of the region and each cell represented by a node of the quadtree, see the abstract, column 3, lines 44-58) for at least the node of the tree (e.g., node 50 of figures 7-8) using the first hierarchical structure (either the opaque sub-image 42 of figure 6 or the bounding box of text 43 of figure 6), wherein the second hierarchical structure indicates at least one visible region (unobscured region such as the circle B of figure 6) represented by the node (if a node is partly obscured by one or more regions represented by other nodes in the expression, a clipping operator is applied to the node in such a way that, when executing a compositing operator, substantially unobscured or visible regions of the image represented at the node are in the resultant composite of the region of the node. When an image is composited and subsequently rendered from an expression tree comprising nodes clipped by a clipping operator, substantially

those portions of the graphical elements that are unobscured or visible by other graphical element of the image are reproduced or rendered. See column 7, lines 20-64).

6. Claim 52:

Politis teaches a method for optimizing an expression tree (column 8, lines 45-60), the expression tree representing a compositing expression for compositing an image and comprising a plurality of nodes, each node of the tree representing at least one region of the image or an operation for combining sub-expressions of the compositing expression, said method comprising the steps of:

Identifying at least one node having an associated complex graphical object (See figures 6-8);

Determining opacity information for node (column 4);

Determining a region representation for the node (e.g., node 50 of figures 7-8) based on the opacity information, the first region representation simultaneously identifying (the compositing operations for combining two portions of a single image involves the "simultaneously identifying") each opaque region (e.g., totally obscured region or opaque sub-image 42 of figure 6), transparent region (the foreground region 39 of figure 6) and partially transparent region (partially obscured region or the bounding box of text 43 of figure 6) of at least one object represented by the node (e.g., determining if the region represented by the node is obscured either totally or partially by one of the regions, see column 7, lines 20-64; column 9, lines 1-11);

Optimizing the expression tree by determining a second region representation (A region representation is known as quadtrees in which the creation of a quadtree representing a region of an image requires the sub-division of the region into a plurality of cells or sub-regions, each cell being a portion of the region and each cell represented by a node of the quadtree, see the abstract, column 3, lines 44-58) for the node using the first region representation (either the opaque sub-image 42 of figure 6 or the bounding box of text 43 of figure 6), the second region representation indicating at least one visible region (unobscured region such as the circle B of figure 6) of the object represented by the node (if a node is partly obscured by one or more regions represented by other nodes in the expression, a clipping operator is applied to the node in such a way that, when executing a compositing operator, substantially unobscured or visible regions of the image represented at the node are in the resultant composite of the region of the node. When an image is composited and subsequently rendered from an expression tree comprising nodes clipped by a clipping operator, substantially those portions of the graphical elements that are unobscured or visible by other graphical element of the image are reproduced or rendered. See column 7, lines 20-64).

Claim 54:

The claim 54 encompasses the same scope of invention as that of claim 52 except additional claimed limitation that each node having an associated complex graphical object is tagged. However, Politis further discloses the claimed limitation that each node having an associated complex graphical object is tagged (column 7, lines 55-64, column 8, lines 7-17).

Claim 56:

The claim 56 encompasses the same scope of invention as that of claim 52 except additional claimed limitation that opacity information is propagated down the tree. However, Politis further discloses the claimed limitation that opacity information is propagated down the tree (column 8, lines 33-44, column 15, lines 53-67, column 16, lines 1-19).

Claim 57:

The claim 57 encompasses the same scope of invention as that of claim 52 except additional claimed limitation that a first region representation of a child node is at least propagated to a parent node associated with the child node. However, Politis further discloses the claimed limitation that a first region representation of a child node is at least propagated to a parent node associated with the child node (column 15, lines 7-33).

Claim 59:

The claim 59 encompasses the same scope of invention as that of claim 52 except additional claimed limitation that a second region representation of a parent node is at least propagated to a child node associated with the parent node. However, Politis further discloses the claimed limitation that a second region representation of a parent node is at least propagated to a child node associated with the parent node (column 15, lines 7-67).

Claim 60:

The claim 60 encompasses the same scope of invention as that of claim 52 except additional claimed limitation that the first region representation is dependent on an operation associated with a node for which the first region representation is determined. However, Politis

further discloses the claimed limitation that the first region representation is dependent on an operation associated with a node for which the first region representation is determined (compositing operations, Table 1, column 3, lines 22-67, column 4, lines 1-4).

Claim 61:

The claim 61 encompasses the same scope of invention as that of claim 52 except additional claimed limitation that the second region representation for a node is determined by combining any first region representations associated with the node. However, Politis further discloses the claimed limitation that the second region representation for a node is determined by combining any first region representations associated with the node (column 15, lines 7-67).

Claim 62:

The claim 62 encompasses the same scope of invention as that of claim 52 except additional claimed limitation that each leaf node of the first region representation is assigned a value depending on an opacity of a region associated with the leaf node.

However, Politis further discloses the claimed limitation that each leaf node of the first region representation is assigned a value depending on an opacity of a region associated with the leaf node (Table 1, column 3, lines 22-67, column 4, lines 1-4).

Claim 63:

The claim 63 encompasses the same scope of invention as that of claim 52 except additional claimed limitation that each node of the first region representation comprises a pointer to indicate children nodes associated with the node. However, Politis further discloses the claimed limitation that each node of the first region representation comprises a pointer to indicate children nodes associated with the node (column 20, lines 1-3).

Claim 64:

The claim 64 encompasses the same scope of invention as that of claim 52 except additional claimed limitation that the first and second hierarchical structures are quadtrees. owever, Politis further discloses the claimed limitation that the first and second hierarchical structures are quadtrees (column 15, lines 7-67).

Claims 65-74 and 76:

The claim 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 76 encompasses the same scope of invention as that of claim 33, 34, 35, 36, 37, 48, 49, 50, 51, 52, 54 except additional claimed limitation of "an apparatus". However, Politis further discloses the claimed limitation of "an apparatus" (see the abstract, figure 12).

Claims 78:

The claim 78 encompasses the same scope of invention as that of claim 33 except additional claimed limitation of "a computer program for a computer comprising software code portions for performing a method". However, Politis further discloses the claimed limitation of "a computer program for a computer comprising software code portions for performing a method" (column 3, lines 36-37, column 18, lines 29-31).

Claims 79:

The claim 79 encompasses the same scope of invention as that of claim 33 except additional claimed limitation of "a computer readable medium storing a computer program". However, Politis further discloses the claimed limitation of "a computer readable medium storing a computer program" (figure 12, column 3, lines 36-37, column 18, lines 29-31).

7. Claim 80:

Politis teaches a method for optimizing an expression tree (column 8, lines 45-60), the expression tree representing a compositing expression for compositing an image and comprising a plurality of nodes, each node of the tree representing at least one region of an object of the image or an operation for combining sub-expressions of the compositing expression, said method comprising the steps of:

Determining a region representation (by the quadtree) for at least one node (e.g., node 50 of figures 7-8) of the tree (image region representations in hierarchical data structures are known in the art as quadtrees), the region representation simultaneously identifying (the compositing operations for combining two portions of a single image involves the "simultaneously identifying") each opaque region (e.g., totally obscured region or opaque sub-image 42 of figure 6), transparent region (the foreground region 39 of figure 6) and partially transparent region (partially obscured region or the bounding box of text 43 of figure 6) represented by the node (e.g., determining if the region represented by the node is obscured either totally or partially by one of the regions, see column 7, lines 20-64; column 9, lines 1-11);

Optimizing the expression tree by determining a compositing information (A region representation is known as quadtrees in which the creation of a quadtree representing a region of an image requires the sub-division of the region into a plurality of cells or sub-regions, each cell being a portion of the region and each cell represented by a node of the quadtree, see the abstract, column 3, lines 44-58) for at least the node of the tree (e.g., node 50 of figures 7-8), the compositing information for a node being determined using the region representation associated with the node, wherein the compositing information represents at least one visible region to be

composited for an object associated with the node (if a node is partly obscured by one or more regions represented by other nodes in the expression, a clipping operator is applied to the node in such a way that, when executing a compositing operator, substantially unobscured or visible regions of the image represented at the node are in the resultant composite of the region of the node. When an image is composited and subsequently rendered from an expression tree comprising nodes clipped by a clipping operator, substantially those portions of the graphical elements that are unobscured or visible by other graphical element of the image are reproduced or rendered. See column 7, lines 20-64).

Claim 81:

The claim 81 encompasses the same scope of invention as that of claim 80 except additional claimed limitation that the compositing information is represented by a first hierarchical structure. However, Politis further discloses the claimed limitation that the compositing information is represented by a first hierarchical structure (Table 1, figures 7 and 8).

Claim 82:

The claim 82 encompasses the same scope of invention as that of claim 81 except additional claimed limitation of identifying nodes of the tree, for which a first hierarchical structure is required, depending on the region representation associated with the node. However, Politis further discloses the claimed limitation of identifying nodes of the tree, for which a first hierarchical structure is required, depending on the region representation associated with the node (column 7, lines 21-28).

Claim 83:

The claim 83 encompasses the same scope of invention as that of claim 80 except additional claimed limitation of the region representation being one or more second hierarchical structure. However, Politis further discloses the claimed limitation of the region representation being one or more second hierarchical structure (column 15, lines 7-67).

Claim 84:

The claim 84 encompasses the same scope of invention as that of claim 80 except additional claimed limitation of the region representation being a bounding box representing an opacity of a region associated with a node. However, Politis further discloses the claimed limitation of the region representation being a bounding box representing an opacity of a region associated with a node (column 15, lines 7-67).

Claim 85:

The claim 85 encompasses the same scope of invention as that of claim 81 except additional claimed limitation that the first hierarchical structure is dependent on the region representation. However, Politis further discloses the claimed limitation that the first hierarchical structure is dependent on the region representation (figures 6-8).

Claim 87:

The claim 87 encompasses the same scope of invention as that of claim 83 except additional claimed limitation that the region representation of a child node is at least propagated to a parent node associated with the child node. However, Politis further discloses the claimed limitation that the region representation of a child node is at least propagated to a parent node associated with the child node (e.g., figures 6-8; column 15, lines 7-67).

Claim 88:

The claim 88 encompasses the same scope of invention as that of claim 87 except additional claimed limitation that a region representation of the parent node is determined by merging at least two second hierarchical structures.

However, Politis further discloses the claimed limitation that a region representation of the parent node is determined by merging at least two second hierarchical structures (column 15, lines 7-67).

Claim 89:

The claim 89 encompasses the same scope of invention as that of claim 87 except additional claimed limitation that a region representation of the parent node is determined by merging at least one second hierarchical structure and a bounding box.

However, Politis further discloses the claimed limitation that a region representation of the parent node is determined by merging at least one second hierarchical structure and a bounding box (column 15, lines 7-67).

Claim 91:

The claim 91 encompasses the same scope of invention as that of claim 81 except additional claimed limitation that a first hierarchical structure of a parent node is at least propagated to a child node associated with the parent node. However, Politis further discloses the claimed limitation that a first hierarchical structure of a parent node is at least propagated to a child node associated with the parent node (column 8, lines 33-44).

Claim 92:

The claim 92 encompasses the same scope of invention as that of claim 83 except additional claimed limitation that the second hierarchical structure is dependent on an operation associated with a node for which the first hierarchical structure is determined. However, Politis further discloses the claimed limitation that the second hierarchical structure is dependent on an operation associated with a node for which the first hierarchical structure is determined (figures 6-8; Table 1).

Claim 93:

The claim 93 encompasses the same scope of invention as that of claim 83 except additional claimed limitation that each leaf node of the second hierarchical structure is assigned a value depending on an opacity of a region associated with the leaf node.

However, Politis further discloses the claimed limitation that each leaf node of the second hierarchical structure is assigned a value depending on an opacity of a region associated with the leaf node (Table 1).

Claim 94:

The claim 94 encompasses the same scope of invention as that of claim 83 except additional claimed limitation that each node of the second hierarchical structure comprises a pointer to indicate children nodes associated with the node. However, Politis further discloses the claimed limitation that each node of the second hierarchical structure comprises a pointer to indicate children nodes associated with the node (column 20, lines 1-3).

Claim 95:

The claim 95 encompasses the same scope of invention as that of claim 83 except additional claimed limitation that the second hierarchical structures are quadtrees. However,

Politis further discloses the claimed limitation that the second hierarchical structures are quadtrees (column 15, lines 7-67).

8. Claim 96:

Politis teaches a method for optimizing an expression tree (column 8, lines 45-60), the expression tree representing a compositing expression for compositing an image and comprising a plurality of nodes, each node of the tree representing at least one region of an object of the image or an operation for combining sub-expressions of the compositing expression, said method comprising the steps of:

Determining at least a portion of opacity information for at least one node of the tree, the portion of opacity information simultaneously identifying (the compositing operations for combining two portions of a single image involves the "simultaneously identifying") each opaque region (e.g., totally obscured region or opaque sub-image 42 of figure 6), transparent region (the foreground region 39 of figure 6) and partially transparent region (partially obscured region or the bounding box of text 43 of figure 6) represented by the node (e.g., determining if the region represented by the node is obscured either totally or partially by one of the regions, see column 7, lines 20-64; column 9, lines 1-11);

Identifying nodes of the tree, for which compositing information is required, depending on the portion of opacity information associated with the node (e.g., column 14-16); and

Optimizing the expression tree by determining a hierarchical structure (A region representation is known as quadtrees in which the creation of a quadtree representing a region of an image requires the sub-division of the region into a plurality of cells or sub-regions, each cell

being a portion of the region and each cell represented by a node of the quadtree, see the abstract, column 3, lines 44-58) for at least one node of the tree (e.g., node 50 of figures 7-8), wherein the first hierarchical structure is determined for a node using the opacity information determined for the node, and wherein the hierarchical structure represents at least visible regions (unobscured graphical element), load regions (any regions are viewed as load regions) and invisible regions (the foreground regions) to be composited, for an object associated with the node (if a node is partly obscured by one or more regions represented by other nodes in the expression, a clipping operator is applied to the node in such a way that, when executing a compositing operator, substantially unobscured or visible regions of the image represented at the node are in the resultant composite of the region of the node. When an image is composited and subsequently rendered from an expression tree comprising nodes clipped by a clipping operator, substantially those portions of the graphical elements that are unobscured or visible by other graphical element of the image are reproduced or rendered. See column 7, lines 20-64).

9. Claim 97:

Politis teaches a method for optimizing an expression tree (column 8, lines 45-60), the expression tree representing a compositing expression for compositing an image and comprising a plurality of nodes, each node of the tree representing at least one region of an object of the image or an operation for combining sub-expressions of the compositing expression, said method comprising the steps of:

Performing a first traversal of the tree (column 14) to determine at least a portion of opacity information (column 3 and 4) for at least one node of the tree, the portion of opacity information simultaneously identifying (the compositing operations for combining two portions of a single image involves the "simultaneously identifying") each opaque region (e.g., totally obscured region or opaque sub-image 42 of figure 6), transparent region (the foreground region 39 of figure 6) and partially transparent region (partially obscured region or the bounding box of text 43 of figure 6) represented by the node (e.g., determining if the region represented by the node is obscured either totally or partially by one of the regions, see column 7, lines 20-64; column 9, lines 1-11);

Optimizing the expression tree by performing a second traversal of the tree to determine compositing information for each node of the tree identified in the first traversal, wherein the compositing information is determined for a node using the portion of opacity information determined for the node, and where the compositing information indicates at least invisible regions (unobscured graphical element), load regions (any regions are viewed as load regions) and invisible regions (the foreground regions) represented by the node (if a node is partly obscured by one or more regions represented by other nodes in the expression, a clipping operator is applied to the node in such a way that, when executing a compositing operator, substantially unobscured or visible regions of the image represented at the node are in the resultant composite of the region of the node. When an image is composited and subsequently rendered from an expression tree comprising nodes clipped by a clipping operator, substantially those portions of the graphical elements that are unobscured or visible by other graphical element of the image are reproduced or rendered. See column 7, lines 20-64).

Claims 98-99, 102:

The claim 98, 99, or 102 encompasses the same scope of invention as that of claim 97 except additional claimed limitation that is identical to claim 81, 83, or 86. The claims are rejected for the same reason set forth in claim 81, 83, or 86 respectively.

Claims 100, 101, 106:

The claim 100, 101, or 106 encompasses the same scope of invention as that of claim 98 except additional claimed limitation that is identical to claim 84, 85, or 90. The claims are rejected for the same reason set forth in claim 84, 85, or 90.

Claim 103:

The claim 103 encompasses the same scope of invention as that of claim 99 except additional claimed limitation that is identical to claim 87. The claims are rejected for the same reason set forth in claim 87.

Claims 104-105:

The claim 104, 105 encompasses the same scope of invention as that of claim 103 except additional claimed limitation that is identical to claim 88, 89. The claims are rejected for the same reason set forth in claim 88, 89 respectively.

Claim 107:

The claim 107 encompasses the same scope of invention as that of claim 106 except additional claimed limitation that is identical to claim 91. The claims are rejected for the same reason set forth in claim 91.

Claims 108-114:

The claim 108, 109, 110, 111, 112, 113, 114 encompasses the same scope of invention as that of claim 80, 81, 82, 83, 84, 96, 97 except additional claimed limitation of "an apparatus". However, Politis further discloses the claimed limitation of "an apparatus" (see the abstract, figure 12). The claim 108, 109, 110, 111, 112, 113, or 114 is therefore rejected for the same reason set forth in claim 80, 81, 82, 83, 84, 96 or 97 respectively.

Claims 105:

The claim 105 encompasses the same scope of invention as that of claim 97 except additional claimed limitation of "a computer program for a computer comprising software code portions for performing a method". However, Politis further discloses the claimed limitation of "a computer program for a computer comprising software code portions for performing a method" (column 3, lines 36-37, column 18, lines 29-31).

Claims 106:

The claim 106 encompasses the same scope of invention as that of claim 97 except additional claimed limitation of "a computer readable medium storing a computer program". However, Politis further discloses the claimed limitation of "a computer readable medium storing a computer program" (figure 12, column 3, lines 36-37, column 18, lines 29-31).

Remarks

9. Applicant's arguments, filed 09/11/2003 and 09/08/2003, paper number 7, have been fully considered but they are not deemed to be persuasive.

10. Applicant argues in essence with respect to claim 33 and similar claims that:

"Accordingly, Applicants submit that nothing in Politis '797 would teach or suggest determining at least a portion of opacity information for at least one node of the tree, the portion of opacity information simultaneously identifying each opaque region, transparent region and partially transparent region represented by the node. As discussed above, these regions are needed in order to take full advantage of possible optimization opportunities that exist in the presence of various operations. Further, Applicants submit that nothing in Politis '797 that would teach or suggest optimizing the expression tree by determining obscurance information for at least the node of the tree using the portion of opacity information that simultaneously identifies each opaque region, transparent region and partially transparent region represented by the node. Applicant submit that claim 33 is clearly patentable over Politis '797."

This is not found persuasive because Politis teaches the claim limitation of determining at least a portion of opacity information (column 4, lines 1-39) for at least one node (e.g., node 50 of figures 7-8) of the tree (image region representations in hierarchical data structures are known in the art as quadtrees), the portion of opacity information simultaneously identifying (the compositing operations for combining two portions of a single image involves the "simultaneously identifying") each opaque region (e.g., totally obscured region or opaque sub-image 42 of figure 6), transparent region (the foreground region 39 of figure 6) and partially transparent region (partially obscured region or the bounding box of text 43 of figure 6) represented by the node (e.g., determining if the region represented by the node is obscured either totally or partially by one of the regions, see column 7, lines 20-64; column 9, lines 1-11);

Politis also teaches the claim limitation of ptimizing the expression tree by determining obscurance information for at least (A region representation is known as quadtrees in which the creation of a quadtree representing a region of an image requires the sub-division of the region into a plurality of cells or sub-regions, each cell being a portion of the region and each cell represented by a node of the quadtree, see the abstract, column 3, lines 44-58) for the node of the tree (e.g., node 50 of figures 7-8) using the portion of opacity information (either the opaque sub-image 42 of figure 6 or the bounding box of text 43 of figure 6) associated with the node (e.g., the node 50 of figure 6; because the resolution of the region is represented by the quadtree), wherein the obscurance information indicates at least one visible region (unobscured region such as the circle B of figure 6) represented by the node (if a node is partly obscured by one or more regions represented by other nodes in the expression, a clipping operator is applied to the node in such a way that, when executing a compositing operator, substantially unobscured or visible regions of the image represented at the node are in the resultant composite of the region of the node. When an image is composited and subsequently rendered from an expression tree comprising nodes clipped by a clipping operator, substantially those portions of the graphical elements that are unobscured or visible by other graphical element of the image are reproduced or rendered. See column 7, lines 20-64).

Therefore, Politis fulfills the amended claim 33 as currently drafted.

10. In Remarks, page 44, Applicant argues in essence that:

"That, the quadtree represents opaque regions of the parent node since transparent regions by their nature do not have the potential to obscure other graphical elements...Further, Politis '797 does not even suggest determining transparent regions

associated with a node since transparent regions by their nature do not have the potential to obscure other graphical elements."

In response, the Examiner notes that the quadtree of Politis not only includes the opaque or partially opaque regions, but also the transparent regions such as the foreground image because any graphical element can be represented in a quadtree for the region representation.

11. In Remarks, page 44, Applicant argues in essence that:

"Politis '797 merely represent the opacity of one pixel having a certain color. A group of pixels may have different opacity values and therefore different levels of transparency or opaqueness. However, an alpha value associated with one pixel, as disclosed by Politis '797, does not simultaneously identify each opaque region, transparent region and partially transparent region represented by a node."

In response, the Examiner notes that Applicant argues with the claim limitation of "simultaneously identifying each opaque region, transparent region and partially transparent region" on a pixel-level. However, the claim recitation of "simultaneously identifying" may be performed on the object-level, i.e., simultaneously identifying the different graphical elements or different regions of the graphical elements. In column 3 and 4, Politis discloses that the compositing operation is performed on a pixel-level through alpha blending for *each pixel* (See column 1, lines 14-27). Applicant is not correct in arguing that Politis is only limited to the compositing operation for only *one pixel*, not a group of pixels having different opacity values and different levels of transparency or opaqueness. A compositing operation such as alpha blending has to be

performed for a group of pixels for the graphical elements. Simple compositing operation can be performed for a graphical element without alpha channel wherein only one alpha value may be associated with a graphical element. However, in general, in the presence of the alpha channel, the compositing operation requires the alpha blending for each pixel of the graphical element.

Conclusion

12. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jin-Cheng Wang whose telephone number is (703) 605-1213. The examiner can normally be reached on 8:00 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mike Razavi can be reached on (703) 305-4713. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-6606 for regular communications and (703) 308-6606 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 395-3900.

jcw
November 20, 2003

MICHAEL RAZAVI
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600